

CLAIMS:

1. A method of making the salt of an acid selected from $C_1 - C_{10}$ carboxylic acids, aromatic carboxylic acids of the formula $\text{Ph}-(\text{CH}_2)_x-\text{CO}_2\text{H}$ where x is 0 - 4, and glycerophosphoric acid, the method including the steps of

combining and mixing the acid and a base selected from the oxides, hydroxides and carbonates of sodium, potassium, calcium and magnesium, or a mixture of any two or more thereof, in a first reaction zone, the combining and mixing step being carried out over a first period to produce a reaction mixture in the first reaction zone;

transferring the reaction mixture at the end of the first period from the first reaction zone to a second reaction zone the transferring step being carried out over a second period; and

allowing heat generated by reaction between the acid and the base in the second reaction zone to drive off sufficient water to produce a product mixture containing less than about 8% (m/m) water, provided that the acid is not 2-hydroxy-4-thiomethylbutyric acid.

2. A method as claimed in Claim 1, in which the first period is 3 - 180 seconds and the second period is 2 - 60 seconds.

3. A method as claimed in Claim 1, in which the combining step takes about 2 - 60 seconds.

4. A method as claimed in Claim 2, in which the first period is 3 - 60 seconds.

5. A method as claimed in any one of Claims 2 to 4 inclusive, in which the second period is 3 - 30 seconds.

6. A method as claimed in any one of the preceding claims, in which the carboxylic acid is a substituted or an unsubstituted $C_1 - C_{10}$ acid.

7. A method as claimed in any one of Claims 1 to 6 inclusive, in which carboxylic acid is monocarboxylic acid selected from formic acid, acetic acid, propanoic acid, butanoic acid, pentanoic acid, hexanoic acid, heptanoic acid, octanoic acid, nonanoic acid, decanoic acid and their alkylated or hydroxylated analogues.
8. A method as claimed in any one of Claims 1 to 6 inclusive, in which the carboxylic acid is a dicarboxylic acid selected from oxalic acid, malonic acid, succinic acid, glutaric acid, adipic acid, pimelic acid, suberic acid, azelaic acid, sibaccic acid and their unsaturated, alkylated or hydroxylated analogues.
9. A method as claimed in any one of Claims 1 to 5 inclusive, in which the acid is benzoic acid or phenylacetic acid.
10. A method as claimed in any one of the preceding claims, in which the acid is in the form of an aqueous solution.
11. A method as claimed in Claim 10, in which the aqueous solution has a concentration of about 60 - 99,5% by mass of the acid.
12. A method as claimed in any one of the preceding claims, which includes allowing the heat generated to drive off sufficient water to produce a product mixture containing less than about 2,5% water.
13. A method as claimed in any one of Claims 10 to 12 inclusive, which includes the prior step of warming the solution of acid to 50 - 96 °C.
14. A method as claimed in any one of the preceding claims, which includes the further steps of successively combining and mixing a plurality of batches of the acid and base with water in the first reaction zone to produce successive batches of the reaction mixture and successively transferring each of the batches to the same second reaction zone.

15. A method as claimed in any one of the preceding claims which includes agitating the reaction mixture in the second reaction zone.

16. A method of making salt of an acid selected from $C_1 - C_{10}$ carboxylic acids, aromatic carboxylic acids of the formula $Ph-(CH_2)_x-CO_2H$ where x is 0 - 4, benzoic acid, and glycerophosphoric acid, the method including the steps of

combining and mixing the acid, a base selected from the oxides, hydroxides and carbonates of sodium, potassium, calcium and magnesium, or a mixture of any two or more thereof and water in a first reaction zone to produce a reaction mixture in the first reaction zone;

continuously transferring the reaction mixture from the first reaction zone to a second reaction zone, the reactants being added to the first reaction zone in successive batches and the reaction mixture being continuously removed from the first reaction zone at a rate which is selected so that the residence time of the reaction mixture in the first reaction zone is between about 1 and 180 seconds; and

allowing heat generated by reaction between the acid and the base in the second reaction zone to drive off sufficient water to produce a product mixture containing less than about 8% water, provided that the acid is not 2-hydroxy-4-thiomethylbutyric acid.

17. A method as claimed in Claim 16 which the heat generated is allowed to drive off sufficient water to produce a product mixture containing less than about 2,5% water.

18. A continuous method of making the salt of an acid selected from $C_1 - C_{10}$ carboxylic acids, aromatic carboxylic acids of the formula $Ph-(CH_2)_x-CO_2H$ where x is 0 - 4, and glycerophosphoric acid, the method including the steps of

simultaneously feeding, into a reaction zone, an aqueous solution of the acid, and a base selected from the oxides, hydroxides and carbonates of sodium, potassium, calcium, magnesium or a mixture of any two or more thereof to produce a reaction mixture in the reaction zone; and

transferring the reaction mixture from the reaction zone to a second zone at a

rate which is selected so that the residence time of the reaction mixture in the reaction zone is sufficient to allow heat generated by reaction between the acid and the base in the reaction zone to drive off sufficient water to produce a product mixture containing less than about 8% water, provided that the acid is not 2-hydroxy-4-thiomethylbutyric acid.

19. A method as claimed in Claim 18, in which the rate is selected so that the residence time of the reaction mixture in the reaction zone is 3 - 20 minutes.

20. A continuous method of making a salt of an acid selected from $C_1 - C_{10}$ carboxylic acids, aromatic carboxylic acids of the formula $\text{Ph}-(\text{CH}_2)_x-\text{CO}_2\text{H}$ where x is 0 - 4, and glycerophosphoric acid, the method including the steps of

simultaneously feeding, into a reaction zone, an aqueous solution of the acid, and a base selected from the oxides, hydroxides and carbonates of sodium, potassium, calcium and magnesium or a mixture of any two or more thereof to produce a reaction mixture in the reaction zone; and

transferring the reaction mixture from the reaction zone to a second zone at a rate which is selected so that the residence time of the reaction mixture in the reaction zone is sufficient to initiate reaction between the acid and the base but not sufficient to drive off water from the reaction mixture and allowing heat generated by further reaction between the acid and the base in the second zone to drive off sufficient water to produce a product mixture containing less than about 8% water, provided that the acid is not 2-hydroxy-4-thiomethylbutyric acid.

21. A calcium, magnesium, sodium or potassium salt of a $C_1 - C_{10}$ carboxylic acid, aromatic carboxylic acid of the formula $\text{Ph}-(\text{CH}_2)_x-\text{CO}_2\text{H}$ where x is 0 - 4 or of glycerophosphoric acid prepared by a method as claimed in any one of Claims 1 to 20 inclusive.

22. A method as claimed in Claim 1 or Claim 16 or Claim 18 or Claim 20, substantially as herein described and illustrated.

23. A salt as claimed in Claim 21, substantially as herein described and illustrated.

24. A new method of making the salt of an acid or a new salt of acid, substantially as herein described.